

California State University, San Bernardino

CSUSB ScholarWorks

Theses Digitization Project

John M. Pfau Library

1984

Computer-assisted instruction: A new approach to teaching safety in vocational education classrooms

C. Don O'Neal

Follow this and additional works at: <https://scholarworks.lib.csusb.edu/etd-project>



Part of the [Vocational Education Commons](#)

Recommended Citation

O'Neal, C. Don, "Computer-assisted instruction: A new approach to teaching safety in vocational education classrooms" (1984). *Theses Digitization Project*. 283.
<https://scholarworks.lib.csusb.edu/etd-project/283>

This Project is brought to you for free and open access by the John M. Pfau Library at CSUSB ScholarWorks. It has been accepted for inclusion in Theses Digitization Project by an authorized administrator of CSUSB ScholarWorks. For more information, please contact scholarworks@csusb.edu.

California State College

San Bernardino

COMPUTER-ASSISTED INSTRUCTION: A NEW APPROACH TO TEACHING
SAFETY IN VOCATIONAL EDUCATION CLASSROOMS"

A Project Submitted to

The Faculty of the School of Education

In Partial Fulfillment of the Requirements of the Degree of

Master of Arts

in

Education: Vocational Education Option


By

C. Don O'Neal

San Bernardino, California

1984

APPROVED BY:


Advisor


Committee Member

Table of Contents

General Introduction	3
Review of the Related Literature	7
Statement of Objectives	13
Design of the Project	14
Statement of Limitations.....	18
Sample Lessons.....	19
Attachments.....	32
References.....	35

General Introduction

Statement of the Problem

The Occupational Safety and Health Act of 1970 (Public Law 91-596) mandated that all employers provide a safe and healthful workplace for all workers. This law specified workplace inspections, abatement of hazards, reporting of all injuries, and job safety training [emphasis provided by the writer]. Job safety training has been deemed important enough to be included in Public Law; therefore, it must surely be included as a primary consideration in all vocational education programs.

Currently, sufficient knowledge of the principles of accident prevention exists to enable school shop instructors to positively modify the safety behavior of their students. Although this knowledge exists, traditional methods of instruction have consistently failed to achieve the desired goal: the building of safe work attitudes and work practices of new workers entering the job market. These failures are graphically illustrated by the number of school children injured in one year. For example, during the 1977-78 school year, there were 19,800 injuries recorded in vocational and industrial arts classes out of a total enrollment of 847,000. This data was derived from reports submitted to the National Safety Council by 22,000 school jurisdictions in the United States (National Safety Council, 1979, p. 90).

If the knowledge of accident prevention exists, why has this knowledge not been transferred to the students? What has been lacking is an innovative, effective method of imparting this knowledge to vocational education students at the secondary level. Computer-Assisted Instruction, effectively applied and closely monitored, can be the foundation for bridging the knowledge gap between established principles and actual practice.

The current generation of secondary and post-secondary students have never known a time without television. Most of them learned the alphabet, color identification, and, in some instances, even basic social skills through the medium of television. Over the last five years, video-based arcade and home video games have taught these same students to interact with a video screen. Therefore, these students should be receptive and readily adaptable to learning through the use of Computer-Assisted Instruction (CAI). The potential for CAI as a learning tool is limited only by the skill and imagination of the instructors.

Traditional vocational instruction relies heavily on lectures and textbooks, augmented by "hands-on" shop training. Although the lecture has certain advantages in regard to motivation and role modeling, some experimental evidence indicates that the lecture conveys information poorly. On the other hand, current research indicates that students using Computer-Assisted Instruction learn

significantly faster than those students taught by traditional methods (Selden & Schultz, 1982, p. 62). CAI emphasizes the practical aspects of learning and provides an inductive approach that complements and advances the deductive processes. The "hidden curriculum" in Computer-Assisted Instruction is that the student learns the importance of order, sequence, and detail in problem-solving exercises (Haga, 1967, p. 21).

The computer will certainly not supplant the traditional teaching method of lecture coupled with actual work on a shop project or mockup. However, it does offer a new approach to incorporating safety principles into shop subjects and provides significant advantages to the student. When used as a learning device, the computer promotes interactive learning where the students become participants rather than spectators. Opportunity for individualization of learning is provided, offering each student a unique learning experience tailored to his needs, desires, and moods. Experiences can be visually represented in shop applications, enriching student insight and intuition about physical hazards and the ways to abate or avoid the hazards without the necessity of exposing the students to the actual hazard.

A primary goal of vocational education is to train workers in the skills needed for entry into the work force. Safety is an integral part of the work process and must be

taught as one of the skills necessary for employment. The continuing high number of injuries among school shop students and in the adult industrial work force is clear evidence that traditional teaching methods have been ineffective in molding the proper safety attitudes.

Computer-Assisted Instruction has been effectively used to enhance the learning process in other subjects and the writer believes that this medium can broaden the safety knowledge and improve the work habits of school shop students.

Review of the Related Literature

The review of the literature concentrated on two main areas of consideration: Computer-Assisted Instruction and accident prevention techniques taught in school shop classes. Computer-Assisted Instruction is the generic term selected by the writer to describe the concept or system of using computers as an aid to learning. This term will encompass the following terms used by various authors to describe the same subject: Computer-Assisted Learning (CAL); Computer-Assisted Instruction (CAI); Computer-Based Education (CBE); Computer-Based Instruction (CBI); Computer-Managed Instruction (CMI); Computer-Based Training (CBT). The literature was inconsistent regarding capitalization of the terms. For consistency, the term Computer-Assisted Instruction will be capitalized throughout this paper.

The literature on the subject of Computer-Assisted Instruction (CAI) was extensive, and much of it has been released within the last two years. On the other hand, the literature available locally on the subject of school shop safety was somewhat limited. However, two recently published manuals were reviewed and these are excellent tools to be used in a vocational education classroom.

While reviewing the literature on Computer-Assisted Instruction, the writer discovered a book that is a "must

read" selection for any teacher who is seriously contemplating using computers as instructional aids. Written in clearly understood language, A Handbook of Computer-Based Training (Dean & Whitlock, 1983) serves as a comprehensive guide to the preparation and presentation of lessons using computers as a media for learning. In the opinion of the writer, this would make an excellent textbook for a course in Computer-Based Training.

Another valuable source of information is Courseware in the Classroom (Lathrop & Goodson, 1982), a guide to selecting, organizing, and using educational software. The authors describe and critique a representative sampling of available educational software. They also provide details and instructions for using computer software in tutorial, simulation, and demonstration situations, as well as practical applications for reinforcement and remediation.

The sources reviewed were unanimous in their praise of the computer as a tool for conducting drill and practice sessions. Since remediation is an integral part of drill and practice, computers can use the data of the problem and the circumstances of the learner's mistake to tailor the remedy to the learner's difficulties. Also, the computer can be used for interactive testing which has been defined as an intimate blend of testing and learning that offers an immediate opportunity for the student to improve his or her performance (Bork, 1981, pp. 15-17).

The CAI Sourcebook (Burke, 1982) provides the baseline technical procedures for writing and developing lessons based on Computer-Assisted Instruction. It is literally a "How to..." book that is a procedural guide for developing CAI, including the construction of forms and the pitfalls to avoid when writing questions. Burke (1982, p. 32), points out that courseware developers should anticipate both right and wrong answers, as well as unanticipated responses. The program should include provisions for null responses and delays.

The most comprehensive source of information on school shop safety was An Accident Prevention Program for School Shops and Laboratories (Williams, 1967). This publication provides a complete guide for establishing and conducting a school shop safety program. Although coverage includes detailed instructions for developing job safety analyses (JSA), including the benefits derived therefrom, there are no specific analyses provided for standard school shop tasks. For example, the use of stepladders or ordinary handtools are common tasks for which safety criteria have been developed to the point that standards have been established. The literature should have included standard job safety analyses for some of the general tasks.

The Industrial Education Safety Guide (California State Department of Education, 1978) approached the subject of school safety from the standpoint of legal obligations of

school administrators. Therefore, the thrust of the publication was directed toward standards of performance and machine guarding techniques. No assistance was provided for teaching accident prevention or for modifying the safety attitudes of students.

On a more positive note, the Sixth National Conference on Safety Education (American Driver and Traffic Safety Education Association, 1978) addressed the subject of safety in the schools with some aggressive measures designed to combat the high school injury rate. The Conference members made the following recommendations for improvement of instruction in safety education programs:

1. That high priority be placed on learning experiences in safety education that would provide students with experience and insight into safety practices in the workplace.

2. Students should be able to correctly identify hazards, assess risks, and make appropriate decisions for implementing corrective actions.

3. Safety education should be integrated with other disciplines at all grade levels.

4. Safety education and its evaluation should be based on performance objectives which are stated in terms of measurable human behavior (performance, conditions, criteria, and person involved).

5. Students should be tested to determine the level of safety knowledge and skills.

6. Appropriate observations should be made by instructors to evaluate safety-related behavior.

7. Safety should be an inherent part of the curriculum in every school shop subject.

8. School shop classes should provide learning experiences which guide student development of attitudes and motor skills for proper, safe and efficient use of facilities and equipment.

The ultimate goal of these recommendations was to lower the frequency and severity of accidents to achieve a safer society (American Driver and Traffic Safety Education Association, 1978, pp. 8-9).

The writer reviewed a pre-publication copy of a manual which is an excellent guide for teaching a general safety class for students enrolled in a vocational education program.

Safety in Vocational Education Programs (Pryor, 1984) is designed to be used as a student workbook for teaching general safety concepts and procedures. The manual has five chapters which cover the importance of safety, personal protective equipment, safety color coding, electrical hazards, and fire prevention. Also included in each section are word puzzles to test vocabulary, and quizzes to measure comprehension. At the end of the workbook, a general safety test is provided to measure student knowledge in the subject. Instructor keys are provided for the puzzles, quizzes, and the test. This is an excellent manual for a

general safety education class; however, its application for a specific vocational subject would be limited.

The review of the literature strongly supported the writer's contention that the need for improved safety training methods exists. The literature on CAI provided ample evidence that Computer-Assisted Instruction is an effective teaching method. The safety-related literature provided factual evidence to show the high number of school shop injuries and the need for improved safe work habits. The safety literature also provided methods for teaching safety concepts and skills in a school shop class. The writer believes that CAI can be effectively used to teach shop safety in vocational education classes.

Statement of Objectives

The project described in the following section is designed to adapt current technology in micro-computers and associated software to be used in teaching safety in vocational education classes. Computer-Assisted Instruction has a proven record of success; safety training in school shop classes does not. The number of injuries that occur each year in vocational education classes provides graphic evidence that a need exists for improved training techniques.

The writer believes that this project, fully developed and implemented, will result in improved safety attitudes and reduced school shop injury rates.

Design of the Project

Procedures

This curriculum development project is intended to enhance the learning process for shop safety in secondary vocational education subjects. The subjects chosen to demonstrate the project are general shop safety and electrical safety. The project was developed in four phases, with each phase being completed before the next one was begun. A procedural review of the four phases follows, along with an overview of two additional phases which will be completed outside of the current project time frame.

Phase 1. A job safety analysis (JSA) was developed for each task to be performed in a typical secondary school shop class. The JSA provides explicit details of the safety considerations pertinent to each task that will be taught during a specific lesson. All necessary personal protective equipment is listed, as well as the proper safety procedures for each step in the task. A sample of the safety analyses used for this project is included at attachment 1.

Phase 2. The completed job safety analyses were used to develop learning objectives in the performance, cognitive, and affective domains for each task. These objectives were then stated in terms of performance, conditions, criteria, and the person who is expected to

perform the task. A list of learning objectives is provided at attachment 2.

Phase 3. After all objectives were formulated, an evaluation instrument was developed for each task to be measured. Concurrently with each question developed in the instruments, an appropriate reinforcement message was written for inclusion in the program during the program writing phase of the project. The evaluation instruments and the reinforcement messages were evaluated using the Simplified Flesch Formula (The Center for Vocational Education, 1977, pp. 10-13) to determine reading grade level. Reading level was set at the sixth grade level for all material.

Phase 4. In this step, the writing, debugging and preliminary testing of all computer programs and instructor materials was accomplished. The project was developed using the APPLE version of the authoring language PILOT (Programmed Inquiry, Learning Or Teaching) as the basis for the computer programming portion of the lessons. The following paragraphs outline the format of the instructional programs.

The students will sign on the computer using standard routines, then will be asked to enter his/her name. This name will then be used in the reinforcers built into the program. The computer monitor screen will display a message which will ask the student which lesson he/she desires.

Lessons to be accomplished will be selected by the instructor before the student begins. After the lesson is selected, a series of multiple choice questions will be displayed on the screen. If the student selects the correct choice, a positive reinforcement message will be presented on the screen. Ten points will be awarded for a correct response on the first try, with a possible total of 100 points per lesson. Point values are assigned to track the student's successful completion of the lesson, since mastery is required before the student can begin work on a specific task.

After the first incorrect response, information or hints regarding the correct task procedures will be displayed on the screen. When the program continues, the question will return to the screen. After the question is missed a second time, the correct answer will be given. The next question will be displayed, and the process will be repeated until all questions have been answered. Five points will be awarded for subsequent correct answers if the question was answered incorrectly the first time.

Upon completion of the test, the student's score will be displayed on the screen, along with an appropriate reinforcement message. Scores for each lesson will be maintained on the student's file in the computer. Students will not be allowed to begin work on a specific shop task until two successive scores of 100% have been recorded on

the safety test for that task. Student competency in safety will be validated by instructor observation during the "hands on" portion of the shop task being taught.

Note: The following two phases are beyond the scope of this project; however, the student intends to complete these two phases for his personal satisfaction and to ensure that the completed programs are usable and effective for use in the classroom.

Phase 5. Upon completion of this project this student intends to field test the evaluation instrument and the logic of the computer programs by actual use in school shop classes in the Colton Redlands Yucaipa Regional Occupational Program (CRYROP). Students and instructors will be asked to critique the lessons and make recommendations for program improvement. Administrative personnel at CRYROP have agreed to allow testing of the programs in classes during the summer of 1984.

Phase 6. Data obtained in Phase 5 will be used to accomplish any necessary restructuring of the evaluation instruments or computer programs. After revision, the final version of the program will be placed in the public domain and will be available to libraries and school districts upon request.

Statement of Limitations

The application of this project for use in the classroom is limited by the availability of computer equipment and the ability of the shop instructor to use that equipment. For this project, an Apple II+ or IIe computer is required. The instructor does not need to understand computer programming, but he/she must be familiar with the operation of these computers. The students participating in this project may be computer novices, but reading level must be at the sixth grade level or higher. The safety terms may be new to some students. If so, those students will be required to complete a vocabulary drill provided by the instructor prior to proceeding with the lessons. The determination of reading level and appropriate vocabulary skills must be made by the instructor before the student begins the lessons.

Sample Lessons

The following objectives are provided for the two sample lessons which follow this section.

OBJECTIVE ONE - SHOPSAFE LESSON

Following a computer-assisted tutorial lesson on general shop safety procedures, secondary students in a vocational education class will be able to identify the correct shop safety practices 100% of the time. Students must be able to demonstrate the correct safety practices during shop tasks, as observed by the instructor.

OBJECTIVE TWO - ELECTRICAL LESSON

Following a computer-assisted tutorial lesson on the hazards of working with electricity, secondary students in a vocational education class will be able to identify the correct safety procedures for working with electricity 100% of the time. Students must be able to identify common electrical hazards while performing shop tasks, as observed by the instructor.

CONT OF LESSON SHOPSAFETY

U S T20
c=0

This is a lesson on general shop
safety procedures.

TART
W\$(30)
Please type your first name.

\$W\$

Hello, \$W\$, welcome to the lesson
on general shop safety.

You must be aware of the hazards in a
school shop and be able to protect
yourself and other students from the
hazards.

Now let's test your knowledge of
general shop safety!

If you want to stop the lesson, just
press <CONTROL-C> at any time. That
is, hold down the key marked 'Control'
and at the same time press the 'C'
key.

When you are ready to begin, press
the space bar.

30

1
Question 1.

When using safety equipment, you must now that it will:

- a. not erase hazards.
- b. protect people from injury.
- c. provide more protection.
- d. all of the above.

D!ALL

: Yes! Safety equipment can prevent serious injury.

:c=c+5

c=c+10

:Q2

:Wrong again. The right answer is d. Move to the next question.

:Q2

:That's not right. Please try again.

Q1

Q2

Question 2.

Long hair must be tied up when working with:

- a. small hand tools.
- b. screwdrivers.
- c. tools with moving parts.
- d. poisonous items.

C!MOVING PARTS

: That's right!

:c=c+5

c=c+10

:Q3

: Wrong again. Move on.

:Q3

No. Long hair can get caught. Try again.

Q2

3

Question 3.

If an object is too heavy to lift, you should:

- a. grip the object firmly.

- c. ask for help.
- d. push yhe object.

22

C!HELP!FRIEND!BUDDY!STUDENT

:Good job!

:c=c+5

c=c+10

:Q4

:You missed this one again. The correct answer is c. Don't be afraid to ask for help.

:Q4

Not the right answer. Try again!

Q3

Q4

Question 4.

An unsafe act which is not allowed in the classroom is:

- a. alertness.
- b. eating.
- c. swearing.
- d. horseplay.

D!PLAY!FOOL AROUND!HORSEPLAY

:Right! Horseplay can cause serious injury.

:c=c+5

c=c+10

:Q5

:You guessed wrong again. Horseplay can HURT people!

:Q5

That's not the answer I'm looking for. Guess again!

Q4

5

Question 5.

Loose clothes can easily be caught in the moving parts of a:

- a. hammer.
- b. pair of pliers.
- c. micrometer.
- d. machine.

1:You're right! Next question.

2:c=c+5

3:c=c+10

4:Q6

5:Not right. The right answer is d.
Moving parts of machinery can grab
your clothes and pull you into the
machine.

6:Q6

7:Sorry, you missed this one.

8:Q5

9:Q6

10:Question 6.

One piece of safety equipment is:

- a. sun glasses.
- b. goggles.
- c. identification chain.
- d. a tie.

11:B!GOGGLES!SAFETY GLASSES

12:Correct! Goggles protect your eyes
from flying chips.

13:Q7

14:No again. The correct choice is b -
goggles save your eyes. Go to the
next one.

15:c=c+5

16:c=c+10

17:Q7

18:Nope. Repeat the question.

19:Q6

20:Q7

Question 7.

The right footwear to be worn in a
hop is:

- a. open-toe shoes.
- b. tennis shoes.
- c. leather shoes.
- d. rubber boots.

21:C!LEATHER SHOES!HARD SHOES.

22:Very good! That was a tricky one, but
you got it!

23:c=c+5

24:c=c+10

25:Q8

26:Close, but not right. Leather shoes
provide the best protection for your

:Q8
 :Try this one again.
 :Q7

:Q8
 :Question 8.

:Rubber gloves are used to prevent:

- a. cuts.
- b. scratches.
- c. fire burns.
- d. chemical burns.

:D!CHEMICAL BURNS

:Yes.

:c=c+5

c=c+10

:Q9

:No again. Rubber gloves are not strong. They protect your hands from chemical burns.

:Q9

:That's not the right answer. Try again.

:Q8

9

:Question 9.

:In most cases, the causes of accidents can be traced to:

- a. defective equipment.
- b. unsafe work practices.
- c. lack of knowledge.
- d. any of the above.

:D!ANY!ALL

:Yes. Any of these can cause accidents.

:c=c+5

c=c+10

:Q10

:You missed again. Try the next one.

:Q10

:Not wrong, but there's a better answer. Try this one again.

:Q9

10

:Question 10.

Leather gloves provide protection from:

- a. cuts.
- b. scratches.
- c. fire burns.
- d. all of the above.

DIAL: ABOVE

: That's right.

: Incorrect. Let's try it again.

: Q10

: 2: Wrong again. You need to try this

lesson another time.

: 2: CLOSE

: : c=c=5

: : CLOSE

: c=c+10

: CLOSE

: c<100>: You've completed this lesson.

: your score for this time was #c .

: c<100>: ANEW

: If your score is 100, tell your

teacher now.

NEW

: If you want to do another lesson,

press <CONTROL> <RESET>. If you are

finished, remove the diskette from the

disk drive and turn off the computer.

type "again" to repeat lesson.

AGAIN: OK

: START

CORE

Congratulations! You scored 100%.
Now you're ready to work safely on

our shop project.

TIT OF LESSON ELECTRICAL

:U S T20

c=0

Introductory remarks to stimulate
thought on the hazards of electricity.

TART

W\$(30)

Please type your first name.

\$W\$

Hello, \$W\$, welcome to the lesson
on electricity.

Electrical tools make our work
easier and let us work faster.
If used the right way, these
tools can be very helpful.

However, if you're not careful with
electricity, the result can be a very
serious injury!

Now let's see what you know about
electrical safety!

If you want to stop the lesson, just
press <CONTROL-C> at any time. That
is, hold down the key marked 'Control'
and at the same time press the 'c'
key.

When you are ready to begin, press
the space bar.

30

1

Question 1.

Improper grounding of electrical equipment can
cause:

- a. tripping.
- b. shock.
- c. friction.
- d. wear.

27

B!SHOCK!ZAP!BURN!PAIN

1: Yes! Your reply jolted me!

2:c=c+5

3:c=c+10

4:Q2

2: Wrong again. The right answer is b.
Move to the next question.

2:q2

That's not right. Your response is
shocking - please try again.

Q1

Q2

Question 2.

Electrical arcing can cause:

- a. insulation.
- b. tripping.
- c. fire.
- d. friction.

C!FIRE!SPARKS

1: Yes! That's a hot one!

2:c=c+5

3:c=c+10

4:Q3

1: No again. Arcing causes sparks,
sparks cause fires! Go on to
question 3.

2:Q3

Wrong. Arcing causes sparks, which
can cause _____.

Q2

Q3

Question 3.

Extension cords must be used only for:

- a. temporary purposes.
- b. permanent purposes.
- c. tying lumber together.
- d. transformers.

A!TEMPORARY PURPOSES!SHORT TERM
:Good job!

28

:c=c+5
c=c+10
:Q4

: You missed this one again. The
correct answer is a. Go on.

Not the right answer. Try again!
Q3

Q4
Question 4.

Using the wrong size fuse or circuit breaker
causes the insulation on electrical
wiring to break down. This can cause:

- a. wear.
- b. friction.
- c. fire.
- d. voltage.

C!FIRE!OVERHEAT!INJURY
:Right! Overheated wiring insulation
can also cause equipment damage.

:c=c+5
c=c+10
:Q5

:You guessed wrong again. Overheated
wiring can cause FIRE!

:Q5
That's not the answer I'm looking
for. Guess again!
Q4

5/
Question 5.

Working with electrical equipment in
wet areas can cause:

- a. shock.
- b. friction.
- c. tripping.
- d. wear.

A!SHOCK
:You're right! Next question.

:c=c+5
c=c+10
:Q6

2:Not right. the right answer is a - shock.

2:Q6

Sorry, you missed this one.

Q5

Q6

Question 6.

A self-grounding plug has:

- a. no prongs.
- b. one prong.
- c. two prongs.
- d. three prongs.

D!3 PRONGS!THREE PRONGS

:Correct! The round prong grounds the tool through the power cord.

:c=c+5

c=c+10

:Q7

:No again. The answer is d - three prongs. Go to the next one.

:Q7

Nope. Repeat the question.

Q6

Q7

Question 7.

Unless the tool is marked "double insulated", all tools must have a:

- a. no prong plug.
- b. one prong plug.
- c. two prong plug.
- d. three prong plug.

D!3 PRONG PLUG!THREE PRONG PLUG

:Very good! That was a tricky one, but you got it! Double insulated tools have two prong plugs; all other tools must have a three prong plug.

WARNING!/ Double insulated tools are clearly marked. Do not use a tool with a two prong plug unless it is marked DOUBLE INSULATED!

:c=c+5

c=c+10

:Q8

:Close, but not right. The right answer is d - three prongs. Move on.

:Double insulated tools are grounded within the tool housing. Try this one again.

:Q7

:

:

:Q8

:Question 8.

:

:

:All tools and equipment must be inspected before you use them. If you find a frayed or broken electrical cord, what should you do?

- a. Use the tool carefully.
- b. Repair the cord yourself.
- c. Throw the cord away.
- d. Show the cord to your instructor.

:D!INSTRUCTOR

:Yes. Always report anything that seems unusual to your instructor.

:c=c+5

:c=c+10

:Q9

:No again. Always report broken tools or equipment to your teacher.

:Q9

:That's not a good idea! Think about it!

:Q8

:Q9

:Question 9.

In most cases, the causes of electrical accidents can be traced to:

- a. defective equipment.
- b. unsafe work practices.
- c. lack of knowledge of the dangers of electricity.
- d. any of the above.

:D!ANY!ALL

:Yes. Any of these can cause accidents.

:c=c+5

:c=c+10

:Q10

:You missed again. Try the next one.

:Q10

answer. Try this one again.

31

Q9

Q10

Question 10.

Electrical tools must not be carried by the power cord. The reason for this is that it:

- a. stretches the power cord.
- b. curls the power cord.
- c. pulls the wiring loose.
- d. gets the power cord dirty.

C:PULLS WIRING!LOOSE

:That's right.

:Incorrect. Let's try again.

:Q10

:2:Wrong again. You need to try this lesson another time.

:2:CLOSE

:c=c+5

:2:CLOSE

:c=c+10

:CLOSE

:c<100):You've completed this lesson.

Your score for this time was #c .

:c<100):ANEW

If your score is 100, tell your teacher.

ANEW

If you want to do another lesson, press <CONTROL> <RESET>. If you are finished, remove the diskette from the disk drive and turn off the computer.

type "again" to repeat lesson.

AGAIN!OK

: START

:CORE

Congratulations! You scored 100%.

Now you're ready to work safely with electrical equipment.

Task: Use of Power Tools

Date:

Required/recommended

Personal protective equipment: Goggles or full face shield

Basic steps	Potential hazards	Safe task procedures
General requirements	1. Electrical shock, rotating parts, pinch points, or flying particles.	1. a) All hand and power tools must be maintained in safe condition. b) All power tools must be equipped with guards during use. c) Hand-held circular saws must have a switch that shuts off power when the switch is released.
Electrical tools	2. Electrical shock, rotating parts, pinch points, or flying particles.	2. a) Tools must be of double-insulated or grounded type to conform to the National Electric Code. b) Use of electric cords for raising or lowering tools is prohibited.
Pneumatic tools	3. Rotating parts, flying particles, whipping hoses.	3. a) Secure pneumatic tools to the hose by a chain or cable to prevent accidental disconnect. b) Use of the hose for raising or lowering tools is prohibited. c) All hoses over 1/2 inch diameter must have a safety device at the air source to reduce pressure if the hose fails.

References

- American Driver and Traffic Safety Education Association.
Proceedings of Sixth National Conference on Safety Education, Volume I. Washington: American Driver and Traffic Safety Education Association, 1978.
- Bork, Alfred. Learning With Computers. Bedford, Massachussetts: Digital Press, 1981.
- Burke, Robert L. CAI Sourcebook. Englewood Cliffs, New Jersey: Prentice-Hall, 1982.
- California State Department of Education. Industrial Education Safety Guide. Sacramento: State Department of Education, 1978.
- Center for Vocational Education, The. Select Student Instructional Materials, Module B-5. Athens, Georgia: University of Georgia, 1977.
- Coburn, Peter; Kelman, Peter; Roberts, Nancy; Snyder, Thomas; Watt, Daniel; and Weiner, Cheryl. Practical Guide to Computers in Education. Menlo Park, California: Addison-Wesley, 1982. [Reviewed, but not cited in the text. Listed for later reference only.]
- Dean, Christopher, and Whitlock, Quenton. A Handbook of Computer Based Training. New York: Nichols, 1983.
- Haga, Enoch, ed. Automated Educational Systems. Elmhurst, Illinois: The Business Press, 1967.
- Hawkrigde, David. New Information Technology in Education. London: Croom Helm, 1983. [Reviewed, but not cited in the text. Listed for later reference only.]

Lathrop, Ann, and Goodson, Bobby. Courseware in the Classroom. Menlo Park: Addison-Wesley, 1982.

National Safety Council. Accident Facts. Chicago: National Safety Council, 1979.

Selden, Paul H., and Schultz, John B. What the research says about CAI's potential. Training, November, 1982.

Williams, William A. An Accident Prevention Program for School Shops and Laboratories. Chicago: National Safety Council, 1967.